EPA-GE Citizen Coordinating Council
April 12, 2006 Meeting
Highlights

Participants: See attached list

Introduction: Suzanne Orenstein, Facilitator, Dean Tagliaferro, EPA Project Manager, opened the meeting with a round of introductions and a review of the agenda.

Dean noted that Susan Svirsky was unable to participate in this meeting and that he would address questions about EPA's approach to implementing the Consent Decree. However, specific questions about Rest of River and Silver Lake remediation may have to wait for Susan's return from sick leave. Dean introduced the three panelists for the evening, noting that although they would be speaking from a national perspective and not specifically about the GE Pittsfield Housatonic River Site, their expertise and experience with capping and dredging policies and projects will be applicable to the Housatonic.

Presentations

Dr. Mike Palermo, Consulting Engineer, Vicksburg, MS – "Subaqueous Capping"

Dr. Palermo began with an overview of his experience with the US Army Corps of Engineers (USACE) dealing with contaminated sediment throughout the country. Before discussing capping techniques, he noted that EPA and Corps policies require that dredging, capping, and monitored natural recovery (MNR) be considered equally for contaminated sediment sites. He made the following key points in his presentation. The slides of his presentation are posted on the EPA website for the GE project at www.epa.gov/ne/ge/publiceventsandmeetings/ccc_041206/249940_capping.pdf.

- In situ capping (ISC) and dredge material (DM) capping have been applied to a number of sites worldwide since 1967, including Puget Sound where more approaches to capping have been done then anywhere else in the US.
- Capping must address two major concerns: the physical properties of a cap must allow it to withstand erosion, and the cap must be able to isolate contaminants and curtail their movement.
- To accomplish these goals, the cap needs to be properly designed, constructed, monitored and maintained
- Numerous guidance documents are on the web for ISC and DM capping[1].

[1] The citations for these guidance documents were clarified after the presentation. The correct citations are: http://www.epa.gov/superfund/resources/sediment/pdfs/guidance.pdf, and http://el.erdc.usace.army.mil/dots/doer/pdf/trdoer1.pdf.

- The *design* of a cap is key. It should be approached as an engineering design problem: characterize the site, design the cap and its placement, obtain and place the appropriate materials, and monitor and manage the site over the long term.
- Caps are designed like layer cakes with individual layers being included for specific purposes (e.g. isolation layer, armoring, habitat layers)
- The chemical isolation portion of the cap requires modeling and laboratory testing to confirm the needed thickness for isolating contaminants.
- A habitat layer as a top layer can be designed to provide optimum habitat features (gravel size, vegetation, etc.)
- *Placement* operations need to consider and plan for contaminant re-suspension during placement, slope stability, bearing capacity of soft sediments being capped, mixing, consolidation, etc.
- The key to placement is usually to place thin layers of material gradually and slowly to build up the thickness of the cap over large areas. Placement in thin layers also allows uniformity and monitoring during the placement effort.
- Sediment capping is most often constructed in water. The Anacostia River in DC is the site of a large pilot capping program comparing various capping materials and alternative materials that could enhance the effectiveness of caps. The Housatonic ½ mile reach project is one of a very few projects where a sediment cap has been placed in a dry area.
- *Monitoring* of cap placement and stability needs to be designed for the specific site and would be a long term program including a construction monitoring phase and a long term monitoring program The long term monitoring involves coring through the cap and analyzing the core samples to confirm that the cap is staying in place (thickness) and analyzing it to ensure that the chemical isolation is working effectively.
- Cap *management* actions are initiated when monitoring shows damage to the cap or failure to isolate the contamination. Actions can include increased monitoring, adding more thickness, or adding another component to the cap. In the most extreme case, it may be necessary to remove the cap and remove contamination beneath it.
- In summary, Dr. Palermo noted that all decisions about capping projects should be risk-based; they should include evaluation of all options equally and balance costs and effectiveness. Combinations of options are often most efficient in order to be project-, site- and sediment- specific.

Q. What mechanisms exist for ensuring that there are resources for maintenance and management in the long-term should the cap fail?

A. Dr. Palermo was unaware of the underwriting aspect of cap maintenance but noted that catastrophic events (e.g. a 100 year storm) could trigger the need for specific monitoring and management.

Q. What's considered long term for monitoring?

A: Usually the monitoring program starts out with frequent monitoring, for example, annually, then bi-annually, then every ten years, twenty years and so forth. If things are going well after that, monitoring may not be needed unless there is an extreme event.

Q. Could taking core sample make the cap leak?
A. No, coring is not a problem. The cores seal back up soon, as the sand fills the void created.

Q. Do you have any experience or knowledge about a geotextile layer? How would it be affected by the core sampling?
A. Geotextile can be a component of a cap to limit mixing of the sediment and the cap. To manage it and still collect core samples, it is possible to set up sampling stations with removable materials and not include geotextile in that small area. Even if the geotextile was punctured, it would not impede its function. The geotextile is used primarily to help with placement of the cap material.

Q. Have geotextiles been used in riverine systems?
A. Yes.

Q. Where you have an area of contamination that does not run bank to bank or otherwise cover a complete area, how, in your experience, do you overlap the cap into uncontaminated areas?
A. You'd overlap to some extent, using the uncontaminated area to help taper off the slope of the cap.

Q. Are you involved in the design of a habitat layer at any particular site?
A. No, but our team has been. They looked at types of fish and determined the optimum habitat components for the fish that they found there.

Q. The Housatonic is a very complex river system, including a channel and ponds, deep lakes, and there are many things going on there. The contamination spreads from the ponds to the river channel and into the floodplain as well. With a capping remedy, if you were to just cap hotspots, how does that stop the other PCBs at lower levels from recontaminating the top of the cap located in the hotspots?
A. Generally, we would look at that issue in the context of risk reduction and assume movement and recontamination of the capped surfaces but we would not leave areas unremediated that would cause the risk to be above the risk threshold for the full area.

Q. Do the guidance documents you mentioned discuss alternative technologies and alternative capping materials?
A. They do to a small degree.

Q. What technologies are used for handling slope issues?
A. A sand cap could be placed in fairly steep conditions, for example on 1 to 2 slope. If the slope is steeper than 1 on 3 or 1 on 4, you may need a pilot study to see if the slope can hold the material. If needed, stringent measures can be used to keep a cap in place.

Q. Where have monitoring and natural restoration been applied? Were any in a PCB site? What are the monitoring results?
A. The few projects underway have had good success in benthic habitats, but these techniques haven't been in place long enough to see results in upper trophic-level organisms.

Q. What has been learned through monitoring about diffusion of PCBs?
A. At some sites, data goes back 25 years and we haven't seen any gross movement of contamination into or on top of the caps. The same processes that caused PCBs to accumulate are the same processes that will hold the contamination in place. In one site upwelling of contamination occurred in an area that hadn't been capped. It was identified through the monitoring program and addressed.

Q. Are there scenarios where you would you say you should never cap? We will be capping an area with PCB levels as high as 36,000 ppm in Silver Lake.
A. Yes. With a highly mobile contaminant like benzene that doesn't want to hold onto sediment and groundwater flow that could move it, a conventional cap would not contain it. Also, where NAPL is in the sediment, a conventional cap would eventually fail. You would need some innovative techniques or would need to cut the groundwater flow in that situation.

Don Hayes, Civil Engineering Department, University of Utah: "Dredging Contaminated Sediments"

Dr. Hayes noted his long experience with various dredging projects that were conducted for navigational and also for environmental purposes. Slides of his presentation are on the EPA web site at www.epa.gov/ne/ge/publiceventsandmeetings/ccc_041206/249941_dredging.pdf. He made the following major points.

- Dredging is a process of sediment removal below overlying water. It is a common practice and has been for many years. 300 million cubic yards of sediment are removed each year by USACE.
- The dredging process creates sediment-water slurries that need to be separated and, when contamination is present, managed and disposed of

carefully. Dealing with the solids and liquids that result from dredging drives a lot of the dredging concerns and costs.

- Environmental dredging removes contaminated sediments, minimizes water quality issues and residual contamination and seeks to minimize community impacts. Costs are often secondary when environmental protection is the major goal, whereas for navigational dredging, costs can be a bigger prohibitive factor.
- There are several dredging technologies available, including hydraulic dredges, mechanical dredges, and hybrid dredges that combine both hydraulic and mechanical methods.
- Hydraulic dredges use water to pump sediment into a barge or disposal site. In situ sediment is 30 – 70% water by weight. One disadvantage of the hydraulic dredging process is that it adds a large volume of water to contaminated sediments and that water needs to be treated before discharging.
- Hydraulic dredges include hoppers and pipeline dredges. The Housatonic is more conducive to a pipeline dredge because it is smaller and the river could accommodate it more easily.
- Mechanical dredging systems are different from hydraulic dredges in that they physically lift the sediment, place it in a barge, and transport the sediments to a shoreline handling facility
- There are several issues and concerns with dredging methods: precision, water quality impacts, and residual sediments

    - *Precision*: Mechanical dredges operate within .5 feet laterally and vertically with a good operator. The level of precision desired for removal of the sediment will control whether this type of dredge is appropriate.
    - *Water quality impacts*: Bucket dredges have about 1% loss and some additional sediment re-suspension from tenders, barges or tug movement, and dredge repositioning
    - *Water quality impacts*: Hydraulic dredges show about .5% re-suspension, but may have other impacts that affect the choice of hydraulic dredges over bucket dredges
    - *Residual sediments*: Dredges do not result in a clean river bottom; residual contamination remains. People attribute this residual contamination to re-suspended sediments, but it actually is the result of a failure to entrain the material during the dredging action. It may be necessary to deal with this problem by dredging more deeply and putting a cap on top.

- Project designers need to select a dredge methodology that matches the physical setting and sediment management alternatives. They may have to use multiple techniques and types of equipment depending on the characteristics of the site.

- Sediment must be moved efficiently from the site to its storage location. A handling and processing facility is needed to stabilize the sediment for transport and disposal.
- Traffic, noise, leakage and cost are all issues with handling dredged materials, especially from mechanical dredges.
- Hydraulic dredges deposit sediment and slurry into a confined disposal facility (CDF), so this technique does not have the same disposal issues. Can build large or small CDFs to let the material dry before removing it.
- Contaminated water also needs to be treated after it is separated from the sediment.

Q. Does the dredging equipment include with it the ability to deposit a sand cap?
A. The sand cap that may be used after dredging is not for isolation purposes. It is used to dilute the contamination and stabilize the sediment.

Q. What is a CDF?
A. Typically it is made of earthen dikes that create a manmade pond. It can be simply constructed and can be semi-permanent.

Randy Sturgeon, EPA Region 3, "Selecting Remedies at Contaminated Sediment Sites"

Mr. Sturgeon provided an overview of EPA experience with remedy selection at contaminated sediment sites. He discussed his work with EPA's Contaminated Sediment Technical Advisory Group (CSTAG) and the EPA's National Remedy Review Board. His slides are posted on the EPA web site at www.epa.gov/ne/ge/publiceventsandmeetings/ccc_041206/249942RemedySelectionProcess.pdf. He made the following points in his presentation.

- The CSTAG monitors the progress of and provides advice regarding large, complex, controversial contaminated sediment sites around the U.S. It has developed 11 principles, which it monitors over the full length of the projects. The Housatonic River project has had two formal reviews by the CSTAG as well as one update on the site. CSTAG issues recommendations and the responsible region responds to them.

- EPA's National Remedy Review Board also evaluates significant site remediation projects.
    - It gets involved in sites where the cleanup is $25 M plus.
    - It gets involved before the cleanup is proposed to the public and looks for national consistency and cost effectiveness (i.e., will the money be spent to reduce risk and is the remedy really going to protect the public).
    - About 20 people are involved from EPA regions, HQs and research labs; they provide comments to regional staff on the projects.

- For the Housatonic Rest of River project, the Corrective Measure Study (CMS) needs to identify the risk, look at actions to address the risk and evaluate ways approaches that can be used to cleanup the river. EPA wants to see a range of alternatives and options laid out in good detail and involving realistic technologies that deliver various degrees of cleanup with a range of costs.
- Regarding remedy selection criteria, they are outlined in Appendix G of the CD and these criteria need to be met before an alternative can be picked. Three of the criteria must be met; they are called general standards. There are six additional criteria called selection decision factors.
- The CMS should present 7-9 alternatives that cover the range of options, costs and degrees of cleanup that allow for good comparison and contrasting without creating an unwieldy evaluation effort
- EPA HQ's approach regarding remedy selection is to evaluate monitored natural recovery, in situ capping, and sediment removal, make a site specific decision among them, and consider various methods for individual areas. Looking for the best alternative that meets the criteria and gives the best overall risk reduction for the site.
- Monitored Natural Recovery (MNR) is a remedy for contaminated sediment that uses naturally occurring processes. MNR will take time so EPA looks for long-term trends to see if it is likely to be effective (are fish tissue levels going down over time, are water contaminant concentrations going down over time, etc.) MNR can be enhanced or jump started, for example with a thin layer placement of sand or sediment or in-situ treatment.

Q. Are there sites similar to Silver Lake in size that are capped or proposed to be capped?
A. Not certain. There is a list of all sites that includes contaminants, remedies, and monitoring activities at the sites. That list will be provided to Susan and Dean.

Q. For the Fox River project shown as an example, the cap will be excluded from areas with more than 50 ppm PCBs. How was that exclusion applied?
A. For the Fox River, any place in the river with PCBs greater than 50 ppm, is excluded from capping. The standard was driven by a toxic substances control act (TSCA) rule. The Fox River remedy is primarily a dredging project but capping is allowed under certain conditions.

CCC Discussion

CCC members noted that the presentations provided a lot of useful information, but that it was a lot to digest and discuss now. One member noted that the detail about dredging and capping is helpful. Another noted that we will probably draw on the information presented as the Rest of River project moves forward.

A member asked if anyone had actually evaluated what it would cost if the PCBs were remediated or destroyed compared to capping, monitoring, etc. The response from EPA was that the Corrective Measures Study will lay out detailed ideas of whether and how to clean the river and one of the things that will be included is a cost estimate. Cost estimates will be part of the evaluation of the alternatives.

A member asked if any landowners with remediated property have asked to be resampled after the last year flooding. The response was that none have asked for resampling.

Future meetings

Suzanne Orenstein noted that the next full CCC meeting is scheduled for September. DEP proposed that an optional meeting on the West Branch be scheduled for May in Pittsfield. The date of May 10th was proposed, but after the meeting, the date was revised to May 17.

The meeting adjourned at 7:45 PM.

CCC Attendance: April 12, 2006

Name	Organization	Email Address	Attended
Members			
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